UTILITY PATENT APPLICATION TRANSMITTAL

(only for new nonprovisional applications under 37 CFR 1 53(b))

Attorney Docket No.	18-1-8	Total Pages	40
First Named Inventor or Application Identifier			
Randy G. Goldberg			
Express Mail Label No.	EM164543413US		

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☒ **Fee Transmittal Form**
   (submit an original, and a duplicate for fee processing)
2. ☒ **Specification** [Total Pages 19]
   (preferred arrangement set forth below)
   - Descriptive title of invention
   - Cross References to Related Applications
   - Statement Regarding Fed sponsored R&D
   - Reference to Microfiche Appendix
   - Background of the Invention
   - Brief Summary of the Invention
   - Brief Description of the Drawings(if filed)
   - Detailed Description
   - Claim(s)
   - Abstract of the Disclosure
3. ☒ **Drawing(s)**(35 USC 113) [Total Sheets 5]
4. **Oath or Declaration** [Total Pages 4]
   a. ☒ Newly executed (original or copy)
   b. ☐ Copy from a prior application(37 CFR 1 63(d))
      (for continuation/divisional with Box 17 completed)
      [Note Box 5 below]
      i. ☐ **DELETION OF INVENTOR(S)**
         Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 163(d)(2) and 1 33(b)
5. ☐ **Incorporation by reference**(useable if Box 4b is checked)
   The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference herein

ADDRESS TO: Assistant Commissioner for Patents
Box Patent Application
Washington, D.C. 20231

6. ☐ Microfiche Computer Program (Appendix)
7. ☐ Nucleotide and/or Amino Acid Sequence Submission
   (if applicable, all necessary)
   a. ☐ Computer Readable Copy
   b. ☐ Paper Copy(identical to computer copy)
   c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

8. ☒ Assignment Papers(cover sheet & document(s))
9. ☐ 37 CFR 3.73(b)Statement ☒ Power of Attorney
10. ☐ English Translation Document (if applicable)
11. ☐ Information Disclosure ☐ Copies of IDS
    Statement(IDS)/PTO-1449   Citations
12. ☐ Preliminary Amendment
13. ☒ Return Receipt Postcard (MPEP 503)
    (Should be specifically itemized)
14. ☐ Small Entity ☐ Statement filed in prior application,
    Statement(s)   Status still proper and desired
15. ☐ Certified Copy of Priority Document(s)
    (if foreign priority is claimed)
16. ☒ Other : Associate Power of Attorney

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information.
☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior Application No:

18. CORRESPONDENCE ADDRESS

☐ Customer Number or Bar Code Label
(Insert Customer No or Attach bar code label here)
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SIGNATURE	*Stephen M. Gurey*	DATE	6/15/98

"Express Mail" Mailing Label Number EM164543413US   Date of Deposit 6/15/98
I hereby certify that this Application
Is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner of Patents, Washington D.C. , 20231

William Olson
(Printed Name of Person Mailing Paper)

William Olson

(Signature of Person Mailing Paper)

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FEE TRANSMITTAL

Patent Fees are subject to annual revision on October 1
These are the fees effective October 1, 1997
Small Entity payments must be supported by a small entity Statement,
otherwise, large entity fees must be paid See Forms PTO/SB/09-12

Complete if Known	
Application Number	
Filing Date	
First Named Inventor	Randy G. Goldberg
Examiner Name	
Group/Art Unit	

TOTAL AMOUNT OF PAYMENT	($)1124.00	**Attorney Docket No.**	18-1-18

METHOD OF PAYMENT (check one)

1. The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to

Deposit Account Number: **01-2745**

Deposit Account Name: **AT&T CORP.**

☒ Charge Any Additional Fee Required Under 37 CFR 1 16 and 1 17

☐ Charge the Issue Fee Set in 37 CFR 1 18 at the Mailing of the Notice of Allowance

2. ☐ Payment Enclosed:
    ☐ Check ☐ Money Order ☐ Other

FEE CALCULATION

1. FILING FEE

Large Fee Code	Entity Fee($)	Fee Description	Fee Paid
101	790	Utility Filing Fee	790.00
106	330	Design Filing Fee	
107	540	Plant Filing Fee	
108	790	Reissue Filing Fee	
114	150	Provisional Filing Fee	
		SUBTOTAL (1) ($)	**790.00**

2. CLAIMS

		Extra Claims	Fee from below	Fee Paid
Total Claims	24 -20=	4	X 22.00 =	88 00
Independent Claims	6 -3 =	3	X 82 00 =	246.00
Multiple Dependent Claims			=	

Large Fee Code	Entity Fee($)	Fee Description
103	22	Claims in excess of 20
102	82	Independent Claims in excess of 3
104	270	Multiple Dependent Claims
109	82	Reissue independent claims over original patent
110	22	Reissue claims in excess of 20 and over original patent
	SUBTOTAL (2) ($)	**334.00**

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Fee Code	Entity Fee($)	Fee Description	Fee Paid
105	130	Surcharge - late filing fee or oath	
127	50	Surcharge - late provisional filing fee or cover sheet	
139	130	Non-English specification	
147	2520	For filing a request for reexamination	
112	920*	Requesting publication of SIR prior to Examiner action	
113	1840*	Requesting publication of SIR after to Examiner action	
115	110	Extension for reply within first month	
116	400	Extension for reply within second month	
117	950	Extension for reply within third month	
118	1510	Extension for reply within fourth month	
128	2060	Extension for reply within fifth month	
119	310	Notice of Appeal	
120	310	Filing a brief in support of an appeal	
121	270	Request for oral hearing	
138	1510	Petition to institute a public use proceeding	
140	110	Petition to revive - unavoidable	
141	1320	Petition to revive - unintentional	
142	1320	Utility issue fee (or reissue)	
143	450	Design issue fee	
144	670	Plant issue fee	
122	130	Petitions to the Commissioner	
123	50	Petitions related to provisional applications	
126	240	Submission of Information Disclosure Statement	
581	40	Recording each patent assignment per property(times number of properties)	
146	790	Filing a submission after final rejection(37 CFR 1 129(a))	
149	790	For each additional invention to be examined (37 CFR 1 129(b))	
		Other fee (specify)	
		Other fee (specify)	

* Reduced by Basic Filing Fee Paid   **SUBTOTAL(3)**

SUBMITTED BY		Complete (if applicable)	
Typed or Printed Name	Stephen M. Gurey	Reg Number	27336
Signature	*[signature]* Date 6/15/98	Deposit Account User ID	01-2745

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IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Randy G. Goldberg
Eric T. Korb
Richard R. Rosinski

Case   18-1-18

Serial No.   **Group Art Unit**

Filed

Examiner

Title   Method and Apparatus for Creating Customer Specific Dynamic
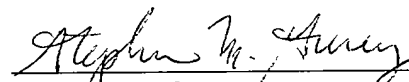Grammars

ASSISTANT COMMISSIONER FOR PATENTS
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SIR:

ASSOCIATE POWER OF ATTORNEY

Please recognize Frank Pietrantonio (Reg. No. 32289) and Dervis Magistre, (Reg. No. 41172) of Kenyon & Kenyon as associate attorneys in the above-mentioned application, with full power to prosecute said application, to make alterations and amendments therein, and to transact all business in the Patent and Trademark Office connected therewith.

Notwithstanding the grant of associate power set forth herein, please direct all written correspondence in this application, as previously stated, to S. H. Dworetsky, AT&T Corp., P. O. Box 4110, Middletown, New Jersey 07748, and please direct all telephone calls in this application to Stephen M. Gurey at 732 957 3924.

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Date: June 15, 1998
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METHOD AND APPARATUS FOR CREATING CUSTOMER SPECIFIC DYNAMIC GRAMMARS

CROSS REFERENCE TO RELATED APPLICATIONS

The present application is related to the following applications: U.S. Patent Application No. 08/763,382, filed December 13, 1996, entitled "STATISTICAL DATABASE CORRECTION OF ALPHANUMERIC ACCOUNT NUMBERS FOR SPEECH RECOGNITION AND TOUCH-TONE RECOGNITION"; U.S. Patent Application No. 08/771,356, filed December 16, 1996, entitled "CONSTRAINED ALPHA-NUMERICS FOR ACCURATE ACCOUNT NUMBER RECOGNITION"; U.S. Patent Application No. 08/909,199, filed August 11, 1997, entitled "A CONFUSION MATRIX BASED METHOD AND SYSTEM FOR CORRECTING MISRECOGNIZED WORDS APPEARING IN DOCUMENTS GENERATED BY AN OPTICAL CHARACTER RECOGNITION TECHNIQUE"; U.S. Patent Application No. 08/909,200, filed August 11, 1997, entitled "METHOD AND APPARATUS FOR PERFORMING AN AUTOMATIC CORRECTION OF MISRECOGNIZED WORDS PRODUCED BY AN OPTICAL CHARACTER RECOGNITION TECHNIQUE BY USING A HIDDEN MARKOV MODEL BASED ALGORITHM"; U.S. Patent Application No. 08/953,579, filed October 17, 1997, entitled "METHOD AND APPARATUS FOR ACCESSING PRE-DEFINED GRAMMARS"; U.S. Patent Application No. 08/953,469, filed October 17, 1997, entitled "METHOD AND APPARATUS FOR MINIMIZING GRAMMAR COMPLEXITY"; U.S. Patent Application No. 08/953,468, filed October 17, 1997, entitled "METHOD AND APPARATUS FOR PERFORMING A GRAMMAR-PRUNING OPERATION"; U.S. Patent Application No. 08/975,587, filed November 20, 1997, entitled "METHOD AND APPARATUS FOR PERFORMING A NAME ACQUISITION BASED ON SPEECH RECOGNITION"; U.S. Patent Application No. 08/975,588, filed November 20, 1997, entitled "CONFUSION SET-BASED METHOD AND APPARATUS FOR PRUNING A PREDETERMINED ARRANGEMENT OF INDEXED IDENTIFIERS"; U.S. Patent Application No. 08/975,589, filed November 20, 1997, entitled "CHECK-SUM BASED METHOD AND APPARATUS FOR PERFORMING SPEECH RECOGNITION"; U.S. Patent Application No. 08/982,678, filed 12/2/97, entitled "METHOD AND APPARATUS FOR ACCESSING A SYSTEM ON

THE BASIS OF PLURAL MATCHING OPERATIONS"; U.S. Patent Application No. 09/018,449, filed 2/4/98, entitled "STATISTICAL OPTION GENERATOR FOR ALPHA-NUMERIC PRE-DATABASE SPEECH RECOGNITION CORRECTION"; and U.S. Patent Application No. 09/018,575, filed 2/5/98, entitled "A CONFUSION SET BASED METHOD AND SYSTEM FOR CORRECTING MISRECOGNIZED WORDS APPEARING IN DOCUMENTS GENERATED BY AN OPTICAL CHARACTER RECOGNITION TECHNIQUE".

BACKGROUND OF THE INVENTION

The present invention is directed to a method and apparatus for creating a dynamic grammar and, in particular, to a method and apparatus that creates such a dynamic grammar in accordance with an externally provided set of criteria.

As computers become more sophisticated, both in the ever-increasing amount of data they can store and process and in the ever-increasing speed at which they communicate with one another, certain institutions have begun to automate those tasks that had heretofore required labor-intensive efforts to accomplish. One such task is processing bill payments from customers. Although companies have for some time now employed large databases to keep track of their customer accounts, most companies still manage their account receivables by printing and mailing out paper bills. This traditional bill payment system has worked quite well in the past but is beginning to burst at the seams with the huge increases in mail volume that occur each year. As the postal service creaks and buckles under this perpetual avalanche of paper, the likelihood of mail being lost, misdelivered, or at least delayed increases. Moreover, as successful companies add more people to their customer rolls, the task of handling paper bills for each of these customers requires companies to spend more money to hire more people and machines to handle outgoing and incoming bills.

Attempts by companies to reduce the enormous volume of paper they must print and mail to customers has prompted some to allow customers to send bill payments electronically. Certain of these automated bill payment systems allow customers to access a company's bill payment system either through a computer or through a conventional telephone. Once a customer is connected to a particular company, he can authorize his

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bank to send payment to the company; thus, the company can receive payments in a more timely manner and at the same time reduce the expenses that are associated with a paper-based billing system. The drawback, however, is that most customers have several bills to pay each month. If a customer wishes to pay all of his bills electronically, the customer would have to initiate a separate communication with each company to which he intends to send payment. For those people who send monthly bills to several different companies, the task of calling or logging on to each company on a separate basis discourages customers from using a system that if used widely would reduce the reliance on paper, reduce the pressure on our postal service, and provide customers as a whole the near-instantaneous certainty that their payments have been properly credited to their accounts. In order to address this concern, several banks allow customers to log into their computer systems and direct payments to those companies that participate in the bank's electronic bill payment system. Although customers can pay several different bills from one electronic "location" with this type of system, such systems may be prone to delays in accessing the pre-stored computer files relating to the desired recipient company if the number of participating companies becomes excessively large. When such a system must keep track of an excessively large amount of companies, the time needed for the system to respond to a customer's request to send payment is slowed by the cumbersome search the system must perform among the many thousands of entries in its database. Furthermore, given a system that stores thousands of company names, if a user can identify a company to receive payment by speaking the company name, the chance of the system confusing acoustically similar company names (e.g., "AT&T" with "NT&T") is great, especially if the system must search through the entire company database in order to match the user-provided input. What is therefore needed is a system that would, instead of conducting such a global database search in order to access a desired data item stored therein, first creates a dynamic grammar that is limited to those data items pertaining to a current customer's account and then conduct the search for the intended recipient of the customer's communication among the data items within this grammar alone.

SUMMARY OF THE INVENTION

In order to overcome the above-mentioned drawbacks of previous automated

bill payment systems, the present invention stores in one system the identities of as many companies as each customer would like to pay on an electronic basis. Thus, each customer, when he or she enrolls in a system employing the principles of the present invention, would register each company to which he wishes to send payments

5 electronically. Each company to which payments may be sent electronically would be associated with at least one unique identifier, each such identifier corresponding to a customer who has selected the associated company to receive payments electronically from his account. The system would maintain this master list of companies and associated unique identifiers in a database. When a particular customer wishes to pay a bill, the

10 customer would enter the unique identifier; on the basis of this identifier, the present invention would create a dynamic grammar, or collection, comprising only those companies that are associated with the entered input identifier. Apart from the input identifier provided by the customer, each company may be identified by such identifiers as generic identifiers or specific identifiers. Generic identifiers cover general classes of

15 companies, such as telephone companies or credit card companies. Specific identifiers correspond not only to the company name itself, but also to any other moniker by which the company may be referred to, such as, for example, "Big Blue" for IBM. Once a dynamic grammar is created for a particular customer, the customer can direct payment to any combination of companies merely by identifying the companies that are to receive

20 payment. Since each dynamic grammar includes only those companies that the associated user has previously enrolled, the customer need not use a company's specific name to identify it as an intended recipient of a payment; instead, if, for example, the dynamic grammar includes a single phone company for a particular customer, the customer may direct payment to such a company merely by entering a command such as "pay phone

25 company" instead of providing the actual name of the company itself. If the dynamic grammar includes more than one specific company under a generic company category, the system may prompt the customer with each specific company in this category until the customer selects the intended company. Even in this situation, the system would save time over previously proposed systems since it would not have to search for each company that

30 is categorized within the generic category provided by the customer; instead, out of all those companies that are categorized within this generic category, the system of the present

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invention would need to present to the user only those companies that the customer specifically enrolled previously.

BRIEF DESCRIPTION OF THE DRAWINGS

5   Fig. 1 illustrates a system for creating a dynamic grammar in accordance with the present invention.

Fig. 2 illustrates an exemplary arrangement of data items that includes those data items in a dynamic grammar.

Fig. 3 illustrates a flow diagram in accordance with a first embodiment of

10   the present invention.

Fig. 4 illustrates a flow diagram in accordance with a second embodiment of the present invention.

Fig. 5 illustrates another system for creating a dynamic grammar in accordance with the present invention.

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DETAILED DESCRIPTION

Fig. 1 illustrates a system 100 that operates according to the principles of the present invention. System 100 includes an information input/output device 5, which may comprise any suitable device by which a user may convey and receive information.

20   Thus, information input/output device may comprise, for example, a telephone, a keyboard/display combination, or a touch-responsive screen. The information input/output device 5 is coupled to a CPU 20. If CPU 20 is remotely located from device 5, the connection may be made through any suitable interface 10. This wired connection may comprise not only telephone lines or coaxial cables, but also fiber optic communication

25   media as well. Instead of arranging the CPU 20 and device 5 at separate locations, however, system 100 may also be embodied as a unitary device in which all the components therein are encased within a common housing. Moreover, the information input/output device 5 need not be coupled to the CPU 20 through a wired connection; communication between these components may be achieved through wireless means as

30   well. Thus, information input/output device 5 and CPU 20 may be equipped or associated with radio, cellular, or infrared transmission technology, and this wireless information

transmission may be in digital or analog form. If the wireless transmissions are analog, then system 100 would also be equipped with suitable A/D and D/A converters to allow the CPU 20 and related components to process the information contained in such transmissions. Associated with CPU 20 are a customer database 35, a dynamic grammar memory 45, and a dynamic grammar module 40. Also coupled to CPU 20 are a data input device 50, which may comprise a keyboard, mouse, CD-ROM or DVD drive, or any other suitable means for entering data into system 100, and a display 55.

The flow chart of Fig. 3 illustrates the operation of CPU 20 in accordance with the dynamic grammar creation routine maintained in module 40. The operation of system 100 shall be explained within the context of an automated bill payment system, although the present invention is not limited thereto. A customer who has an account at a bank would enroll in such a system by listing all the participating companies to which electronic bill payments are to be sent at his direction. For example, the customer may provide the bank with the names of his telephone company, gas company, credit card companies, and department store companies. The information provided by the customer is entered into customer database 35 and associated with his particular account number through data input device 50. The database 35 includes similar information for each other customer who has enrolled in this automated bill payment system. Thus, the database 35 may include a list of all the generic types of companies that can serve as payee companies, such as BANKS, TELEPHONE COMPANIES, CABLE TV COMPANIES, etc. Each generic class of company would include a list of specific participating companies that are properly classified within the generic class. Thus, the CABLE TV category in database 35 may be linked to such specific companies as TCI or COMCAST. Depending on the geographic reach of the customer base served by system 100, each generic category may include companies that operate within a particular city, state, region, or even country. In this possible arrangement of information in database 35, each specific company would be associated with the automated payment account numbers of those customers who intend to electronically send payments to such a company. Thus, the TCI cable TV company would be associated in database 35 with the account numbers of those TCI subscribers who wish to pay their cable TV bills automatically through system 100.

Returning to Fig. 3, when a customer wishes to pay a particular bill, the

customer accesses the bank through information input/output device 5. The customer then
provides his bank account number through device 5 (step 300). This account number may
be referred to as an input identifier. For purposes of this discussion, the term "identifier"
refers to any aggregation of letters, numbers, or typographic characters; an identifier may

5   comprise either an actual word or a non-word. For manifestations of system 100 that
require users to enter information by speaking it, the identifiers may be pronounced as a
whole word or on a character-by-character basis. Thus, if an identifier comprises "JOHN", a
user may provide this identifier to device 5 (if it comprises a voice input/output device) either
by pronouncing the whole word, or by pronouncing the characters individually, as in J-O-H-

10 N. The input identifier is conveyed to CPU 20 through interface 10. CPU 20 then uses
the received account number to access from database 35 the associated payee companies,
organized according to their proper generic class, originally supplied by the customer
during enrollment. CPU 20 pulls this information from database 35 and supplies this
information to memory 45, thus creating a dynamic grammar for this particular transaction

15 (step 305). As used herein, the term "grammar" relates to a collection of various data
items, and the term "dynamic grammar" refers to a grammar that has been generated on a
real-time basis in response to input information provided by a customer operating device 5.

An example of a dynamic grammar is illustrated in the table of Fig. 2.
Although the identifiers listed herein correspond to only one particular customer, the

20 system 100 is capable of creating as many of these dynamic grammars as there are account
numbers. In this arrangement of identifiers, the left-hand side of the table refers to
generic identifiers, such as PHONE COMPANY, GAS COMPANY, BANKS, etc.
Associated with each generic identifier is at least one specific identifier, which identifies a
particular payee of the customer. In the example of Fig. 2, the phone company is AT&T;

25 the gas company is PSE&G; and the banks are PNC and CITIBANK. It should be noted
that the dynamic grammar includes only those generic and specific identifiers for which
the particular customer has registered; it does not include all of the possible generic
identifiers maintained in database 35. Instead, the dynamic grammar omits those company
types and names that the customer did not register with his account. Thus, even though

30 database 35 includes a generic identifier for WATER COMPANY and allows customers to

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register their own particular water companies in this category, if a particular customer did not register any water company with his account, then the dynamic grammar created for that customer will not include a WATER COMPANY generic identifier. For a given generic identifier, multiple associated payee identifiers may correspond not only to

5   separate payees, but also to different ways of referring to the same payee company. For example, in the PHONE COMPANY category, multiple specific identifiers such as AT&T and BELL ATLANTIC would obviously refer to separate companies, but multiple specific identifiers such as AT&T and AMERICAN TELEPHONE AND TELEGRAPH would refer to the same company. By taking into account multiple ways of referring to the same

10   company, the system 100 provides the user with the flexibility of referring to a company by any one of several ways. This added flexibility also relieves the user from having to remember a specific way to refer to a company; all that is required is that the user remember one of several ways of identifying a company. Of course, the table arrangement seen in Fig. 2 is not the only way to arrange the payee identifiers for a particular

15   customer. The dynamic grammar memory 45 and the customer database 35 is capable of arranging such information according to other suitable data structures such as linked lists, arrays, or hash tables.

      After system 100 creates a dynamic grammar for a customer in memory 45, the user is prompted to provide information identifying a payee company that the user

20   desires to pay (step 310). If the user is accessing CPU 20 through a telephone, the prompt may be provided by any suitable voice prompt device; if the user is accessing CPU 20 with a keyboard/display combination, the prompt requesting the payee identity would be transmitted to the display. The selection provided by the user is referred to as a payee identifier and, depending on the information input/output device 5, it may be provided by

25   manipulating a set of keys, by pronouncing the payee name, or by touching a combination of certain regions on a touch screen surface, for example. Once the payee identifier is received at CPU 20, CPU 20 determines whether the payee identifier corresponds to a generic name of the dynamic grammar in memory 45 (step 315). This search takes into account the possibility that instead of entering information specifically identifying a

30   particular company, the user provides some type of generic description of the desired company. Thus, if the user wants to pay AT&T, he may enter into device 5 information

that only identifies the desired payee company as "PHONE COMPANY". If the user does indeed enter such generic information into device 5, CPU 20 obtains the specific payee identifiers associated with the generic description provided by the user (step 320). If the number of specific payee company identifiers is only one (step 325), then CPU 20 selects that single, associated payee company for payment. System 100 would then authorize, according to any suitable means, the financial institution associated with system 100 to transfer funds from the user's account to the payee company selected in step 345.

If in step 325 more than one payee identifier is associated with the generic payee identifier provided by the user, CPU 20 prompts the user with each of these specific payee identifiers until the user acknowledges one of them as the desired payee (step 330). Thus, if the user enters a generic payee identifier such as VISA, CPU 20 would prompt the user with CITIBANK VISA and PNC VISA in order to require the user to select one of these institutions as the desired payee. Of course, if the user originally entered a specific payee identifier, then CPU 20 would directly implement the payment step (step 345) without having to first find a generic payee identifier and then an associated specific payee identifier. Additionally, if the identifier information originally entered by the user at step 300 does not match any particular generic or specific identifier maintained at dynamic grammar memory 45, CPU 20 may issue an error message and reprompt the user for the input identifier (i.e., account number) again. This would require system 100 to recreate a dynamic grammar. Alternatively, instead of creating a dynamic grammar multiple times for the same user, the reprompt may instead require the user to enter another payee identifier, in which case the CPU 20 would use the newly entered payee identifier to search the dynamic grammar that was created when the user first accessed system 100.

Creating a dynamic grammar is not the only way to select a specific identifier. Instead, such information may be obtained directly from database 35. The particular manner in which such information may be obtained directly from database 35 is illustrated by the flow chart of Fig. 4. As with Fig. 3, the procedure of Fig. 4 begins when the user provides an input identifier to CPU 20 through information input/output device 5 (step 400). Within the context of an automated bill payment system, this input identifier may correspond to the user's bank account number. After receiving the account

number, CPU 20 requires the user to enter a generic payee identifier, such as for example, GAS COMPANY or PHONE COMPANY (step 405). Once CPU 20 has obtained from the user an input identifier (identifying a particular account) and a generic payee identifier (identifying the type of company that is to receive payment), CPU 20 uses this information to obtain from database 35 those specific payee identifiers that are associated with the generic payee identifier of the account in question (step 410). As stated above, each user's account number is associated in database 35 with those companies to which he may direct electronic payments. Unlike the procedure outlined in Fig. 3, the specific payee identifiers are obtained according to the procedure of Fig. 4 without first creating a dynamic grammar that includes all the specific payee identifiers for that particular user. After pulling from database 35 those specific payee identifiers that are associated with the generic payee identifier provided by the user, CPU 20 determines whether the amount of accessed specific payee identifiers exceeds one (step 415). If the amount of specific payee identifiers exceeds one, then CPU 20 prompts the user in the same manner as discussed above to select one specific payee identifier (step 420). If only one specific payee identifier was associated with the generic payee identifier provided by the user, then that specific payee identifier is selected for payment (step 425).

As explained above, system 100 may be embodied in several possible ways. The system 100 may comprise a single, unitary device; it may use wireless communication techniques to convey information between the user and CPU 20, and it may use any one of several different types of information input/output devices. One example is illustrated in Fig. 5, which illustrates a system 200 that uses speech recognition to convey information from the user to CPU 20. System 200 includes a voice input/output device 5, which may comprise a conventional telephone or microphone. A user wishing to access CPU 20 in order to make a bill payment would be prompted to speak an input identifier into voice input/output device 5. For purposes of this discussion, the user shall be assumed to speak a valid input identifier into device 5. This voice signal can be carried over a telephone line to interface 10, which may comprise a public switched telephone network ("PSTN") and which interfaces the voice signal generated by voice input/output device 5 to the remaining components of system 200. Of course, as explained before, any suitable wired or wireless connection could convey the voice signal to the remaining components of system 200. System 200 further includes an

A/D converter 15, which converts the analog voice signal provided by interface 10 into a digital signal. A/D converter 15 supplies the digitized voice signal to speech recognizer 25, which may comprise, for example, a HARK 3.0 recognizer, which is manufactured by BBN Co.. After employing a recognition routine based on, for example, the Hidden Markov Model, speech recognizer 25 provides as an output a recognized identifier, which is intended to correspond to the identifier that the user spoke into the telephone. The recognized output is provided to an input of CPU 20, which then performs the company identification procedures outlined above in connection with Figs. 3 and 4. CPU 20 is configured to determine whether the recognized identifier corresponds to any one of a plurality of valid identifiers stored in database 35, which may comprise a hard disk or any other suitable storage medium capable of storing a large number of account numbers. CPU 20 controls a voice prompt device 30, which may comprise DIALOGIC telephone interface cards. CPU 20 causes prompt device 30 to issue voice inquiries to a user at voice input/output device 5. For example, the voice prompt device 30 may issue such inquiries as "Please tell me your account number" and "Please tell me the name of the company that is to receive payment" . As with system 100, system 200 also includes a data input device 50, such as a keyboard, a CD-ROM drive, or a floppy drive, and the system 200 is also provided with a display 55.

By using a system as embodied in accordance with the principles set forth above, a customer may facilitate the manner in which bill payments are made and ensure that such bill payments are received promptly. Moreover, by allowing users to identify a company by a generic identifier or by any one of a group of specific identifiers, the present invention avoids requiring users to remember one specific way by which a company must be properly identified. Thus, the ease of use that is thus presented by the principles of the present invention encourages users to enroll in such automated bill payment systems, with the result that bill payments are received not only with more speed than if normal postal services are used, but also with greater assurance that the bill payment will in fact be received by the payee, since the possibility of a bill payment being lost or otherwise misdirected while it is in electronic transit to the payee is much less than if a printed bill payment was sent using normal postal delivery. If enough users enroll in such a system, the pressure on our paper resources may also ease somewhat because payee institutions would not need to send out as many bills and their customers would not need to use as many printed checks.

[GOLDBERG 18-1-18]

     The above described embodiments are illustrative of the principles of the present invention. Other embodiments could be devised by those skilled in the art without departing from the spirit and scope of the present invention.

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WHAT IS CLAIMED IS:

1. A method of creating a dynamic grammar from a predetermined arrangement of first type identifiers and second type identifiers, each first type identifier being associated with one second type identifier, the method comprising the steps of:

a) obtaining at least one first type identifier in accordance with a first type of predetermined criteria;

b) obtaining the second type identifier associated with each obtained first type identifier; and

c) creating the dynamic grammar by arranging the obtained first type identifier and the associated second type identifier in accordance with a predetermined configuration.

2. The method according to claim 1, wherein each first type identifier is further associated with at least one third type identifier, and wherein the step a) comprises:

i) establishing an existence of a predetermined relationship between the predetermined criteria and at least one third type identifier; and

ii) obtaining each first type identifier associated with the third type identifier having the predetermined relationship with the predetermined criteria.

3. The method according to claim 2, wherein the predetermined criteria comprises an account number provided by a user, and wherein each third type identifier comprises a predetermined account number included within the predetermined arrangement.

4. The method according to claim 2, wherein the step b) comprises:

iii) determining for each first type identifier determined in step ii) the second type identifier associated therewith.

5. A method of selecting one of a plurality of destinations to receive a

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predetermined communication on the basis of at least a first input identifier, each

destination being identified by one of a plurality of specific identifiers, each specific

identifier being associated with at least one customer identifier and with one of a plurality

of generic identifiers, the method comprising the steps of:

5   a) determining which customer identifier corresponds to the input identifier;

      b) obtaining each specific identifier associated with the determined customer

identifier;

      c) obtaining a second input identifier;

      d) determining whether the second input identifier corresponds to one of

10 any specific identifier obtained in step b) and any generic identifier associated with each

specific identifier obtained in step b);

      e) selecting, if the second input identifier corresponds to a generic identifier,

a specific identifier associated with the generic identifier to which the second input

identifier corresponds, the selected specific identifier corresponding to a destination

15 identifier;

      f) selecting, if the second input identifier corresponds to one of the obtained

specific identifiers, the specific identifier to which the second input identifier corresponds

as the destination identifier; and

      g) selecting the destination associated with the selected destination identifier

20 to receive the predetermined communication.

      6. The method according to claim 5, wherein each customer identifier

corresponds to an account number.

25   7. The method according to claim 6, wherein each specific identifier

identifies a particular institution, and wherein each generic identifier identifies a type of

institution.

      8. The method according to claim 7, wherein the predetermined

30 communication comprises a bill payment.

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9. The method according to claim 8, wherein the step b) comprises:

arranging each obtained specific identifier and each generic identifier associated with each obtained specific identifier into a predetermined data structure.

10. The method according to claim 9, wherein the predetermined data structure comprises a dynamic grammar.

11. An apparatus for creating a dynamic grammar from a predetermined arrangement of first type identifiers and second type identifiers, each first type identifier being associated with one second type identifier, the apparatus comprising:

a) first means for obtaining at least one first type identifier in accordance with a first type of predetermined criteria;

b) second means for obtaining the second type identifier associated with each obtained first type identifier; and

c) means for arranging the obtained first type identifier and the associated second type identifier in accordance with a predetermined configuration.

12. The apparatus according to claim 11, wherein each first type identifier is further associated with at least one third type identifier, and wherein the first means for obtaining comprises:

i) means for establishing an existence of a predetermined relationship between the predetermined criteria and at least one third type identifier; and

ii) third means for obtaining each first type identifier associated with the third type identifier having the predetermined relationship with the predetermined criteria.

13. The apparatus according to claim 12, wherein the predetermined criteria comprises an account number provided by a user, and wherein each third type identifier comprises a predetermined account number included within the predetermined arrangement.

14. The apparatus according to claim 12, wherein the second means for obtaining comprises:

iii) means for determining for each first type identifier determined by the third means for obtaining the second type identifier associated therewith.

15. An apparatus for selecting one of a plurality of destinations to receive a predetermined communication on the basis of at least a first input identifier, each destination being identified by one of a plurality of specific identifiers, each specific identifier being associated with at least one customer identifier and with one of a plurality of generic identifiers, the apparatus comprising:

a) first means for determining which customer identifier corresponds to the input identifier;

b) first means for obtaining each specific identifier associated with the determined customer identifier;

c) second means for obtaining a second input identifier;

d) second means for determining whether the second input identifier corresponds to one of any specific identifier obtained by the first means for obtaining and any generic identifier associated with each specific identifier obtained by the first means for obtaining;

e) first means for selecting, if the second input identifier corresponds to a generic identifier, a specific identifier associated with the generic identifier to which the second input identifier corresponds, the selected specific identifier corresponding to a destination identifier;

f) second means for selecting, if the second input identifier corresponds to one of the obtained specific identifiers, the specific identifier to which the second input identifier corresponds as the destination identifier; and

g) third means for selecting the destination associated with the selected destination identifier to receive the predetermined communication.

16. The apparatus according to claim 15, wherein each customer identifier corresponds to an account number.

17. The apparatus according to claim 16, wherein each specific identifier identifies a particular institution, and wherein each generic identifier identifies a type of institution.

18. The apparatus according to claim 17, wherein the predetermined communication comprises a bill payment.

19. The apparatus according to claim 18, wherein the first means for obtaining comprises:

means for arranging each obtained specific identifier and each generic identifier associated with each obtained specific identifier into a predetermined data structure.

20. The apparatus according to claim 19, wherein the predetermined data structure comprises a dynamic grammar.

21. An apparatus for reducing a predetermined collection of data items to a customized arrangement comprising a subset of said data items, comprising:

a memory that stores the predetermined collection of data items;

a processor coupled to the memory, the processor being responsive to a set of predetermined criteria;

means for selecting at least one of the set of predetermined criteria, the means for selecting being coupled to the processor; and

means, coupled to the processor, for controlling the processor to create the customized arrangement in accordance with the selected criteria.

22. An apparatus for creating a dynamic grammar, comprising:

a processor device having an input for receiving at least a first information signal;

a customer database in communication with the processing device;

a dynamic grammar module in communication with the processing device;

and

a dynamic grammar memory in communication with the processing device.

23. The apparatus according to claim 22, further comprising:

an information input device having an output for providing the first information signal to the processing device and an input for receiving an input signal from which the first information signal is derived by the information input device.

24. The apparatus according to claim 23, wherein the input signal comprises a voice signal, and wherein the information input device includes a speech recognizing device for converting the voice signal to the first information signal.

[GOLDBERG 18-1-18]

ABSTRACT OF THE DISCLOSURE

A method and apparatus create a dynamic grammar pertaining to a current user from a global database of data items. A user first identifies himself to the system using a predetermined input identifier, such as an account number, for example. On the basis of this input identifier, the system of the present invention extracts from a global customer database those data items that are associated with the input identifier of the customer. A dynamic grammar including these extracted data items is created, and the system performs a search for a particular data item within this dynamic grammar on the basis of further search criteria that are provided by the customer.
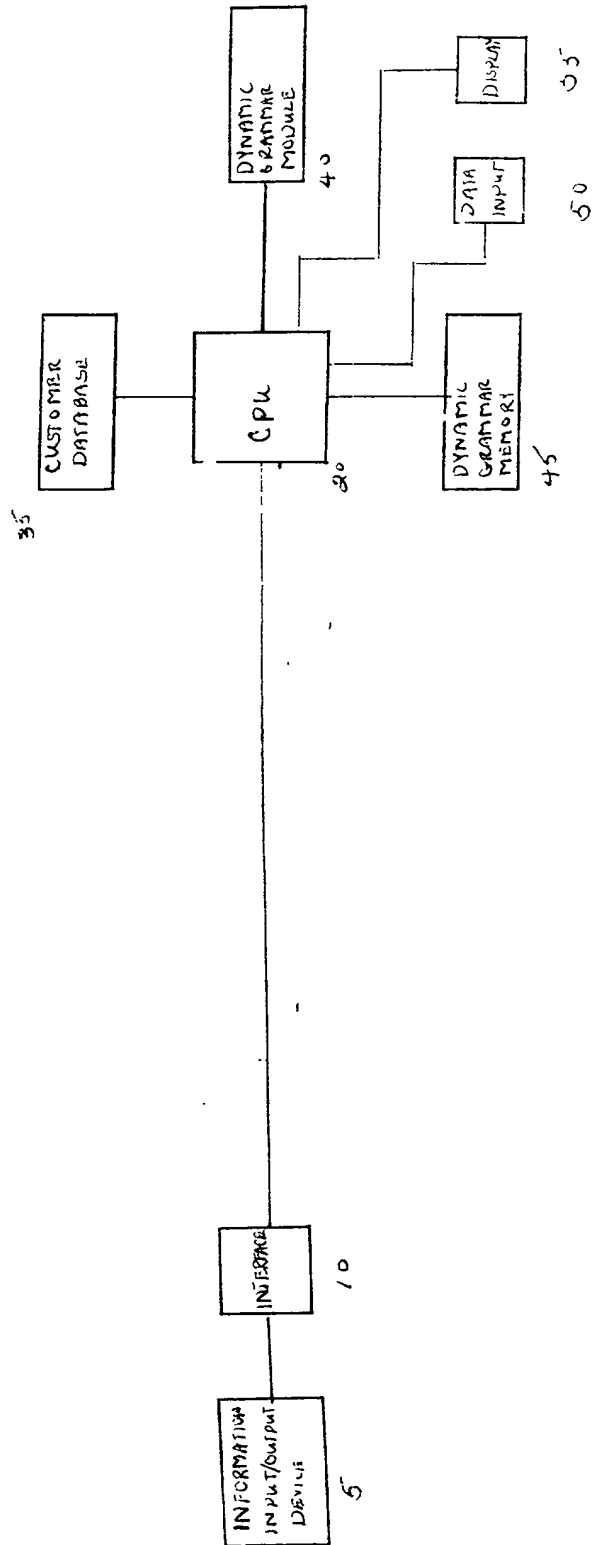
172851

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Fig. 1

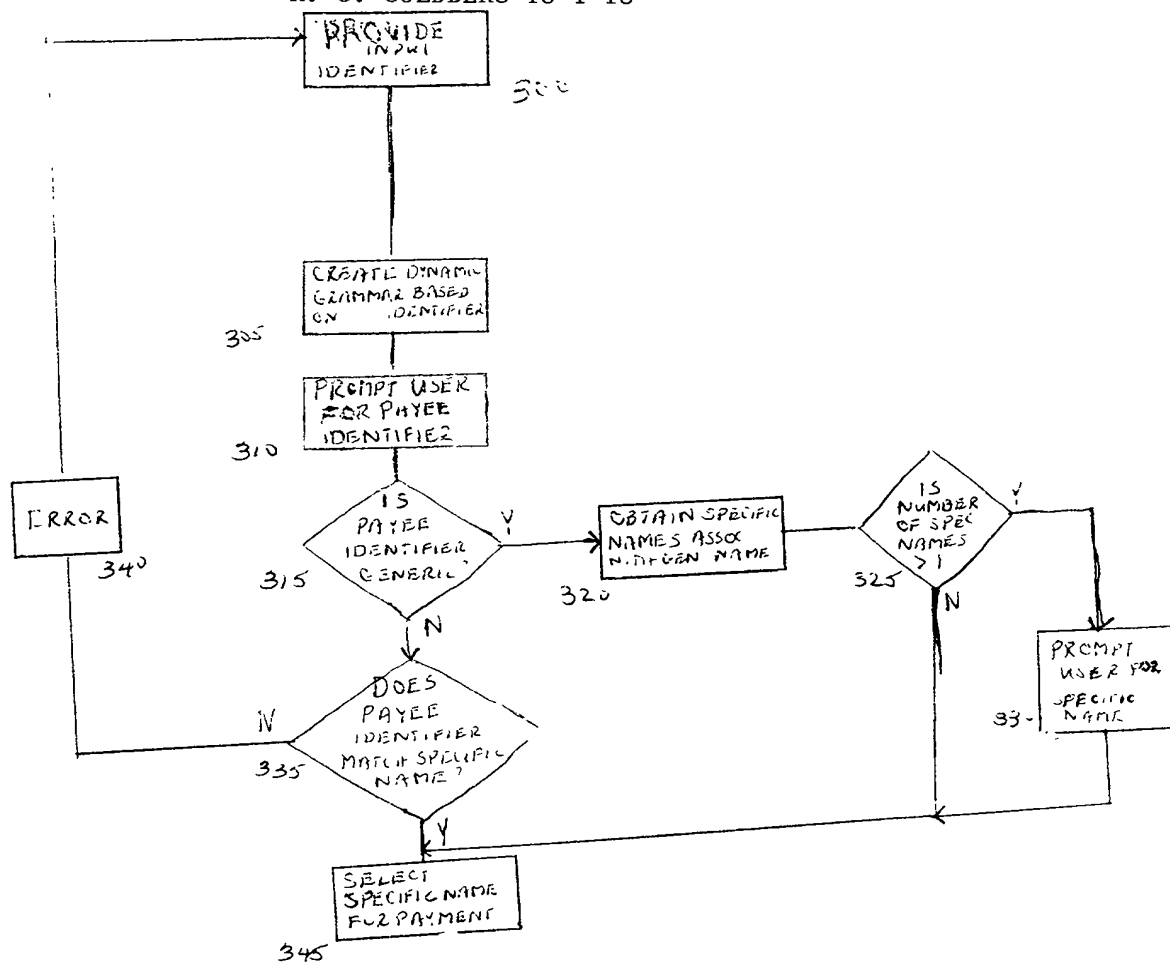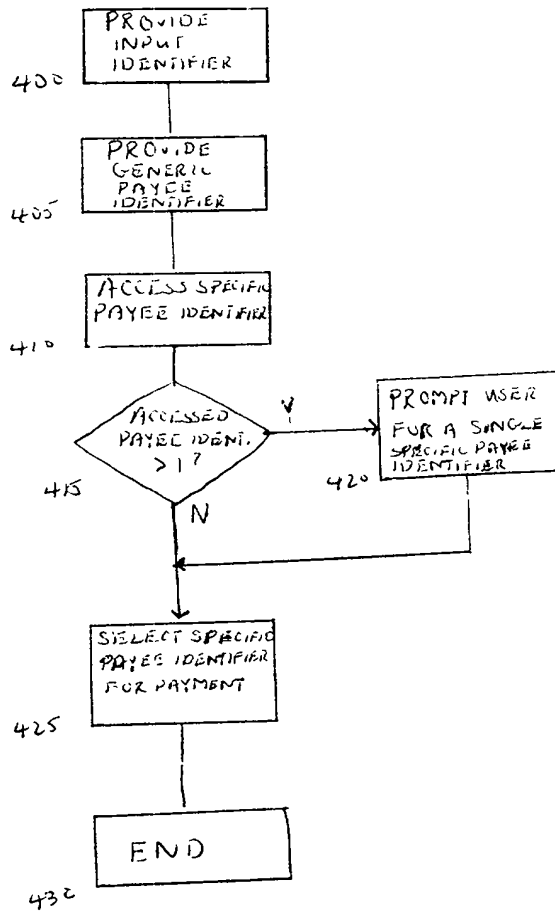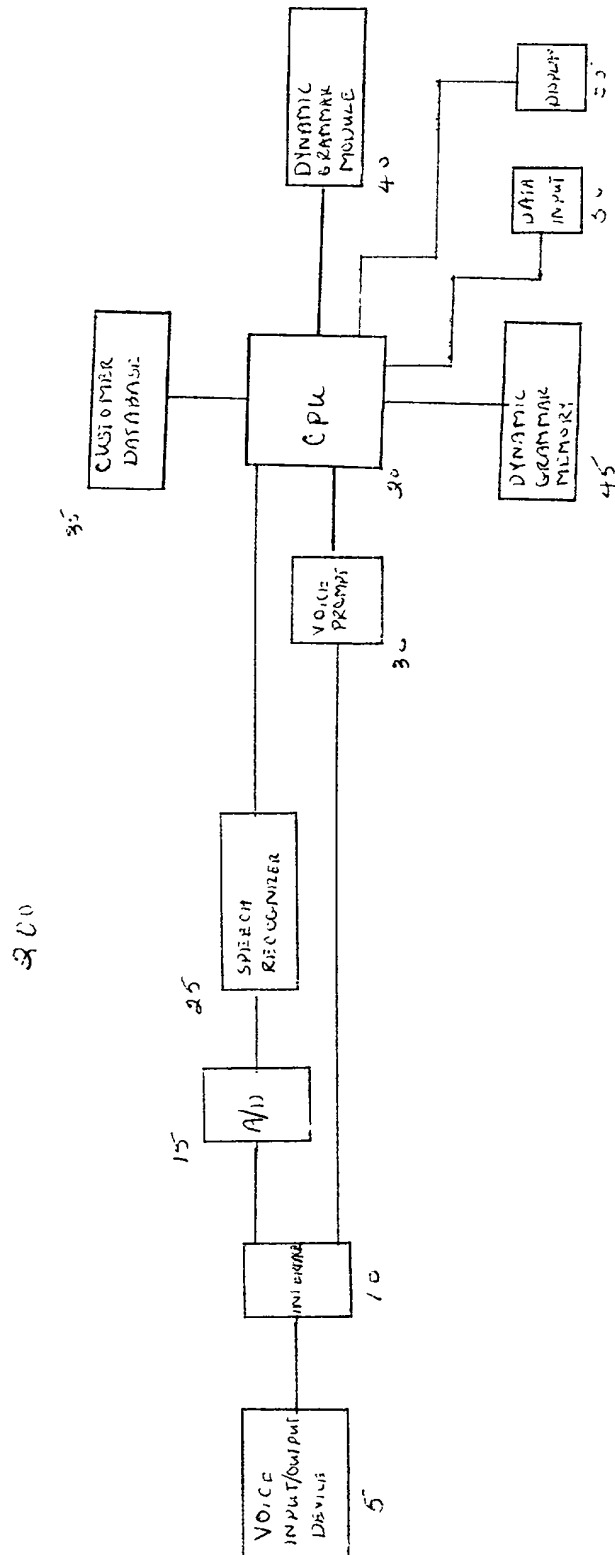| GENERIC NAME	SPECIFIC NAME
PHONE COMPANY	AT&T
GAS COMPANY	PSE&G
DEPARTMENT STORES	MACY S J.C. Penney NORDSTROM
BANKS	PNC BANK CITIBANK
BROKER	CHARLES SCHWAB
VISA	CITIBANK VISA PNC VISA
MASTERCARD	NATWEST MASTERCARD

Fig. 2

Fig. 3

Fig. 4

Fig. 5

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

Declaration and Power of Attorney

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled **Method And Apparatus For Creating Customer Specific Dynamic Grammars** the specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by an amendment, if any, specifically referred to in this oath or declaration.

I acknowledge the duty to disclose all information known to me which is material to patentability as defined in Title 37, Code of Federal Regulations, 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

None

I hereby claim the benefit under Title 35, United States Code, 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, 112, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

None

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.
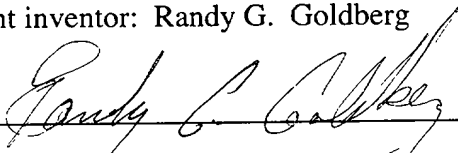
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